R E P O R T R E S U M E S

ED 018 938 EF 000 554

STATE OF NEW YORK STANDARD PLAN TYPE A-2, ONE-STORY 21-28 CLASSROOM ELEMENTARY SCHOOL.

LUX (AUGUST) AND ASSOCIATES, ALBANY, N.Y.

NEW YORK STATE EDUCATION DEPT., ALBANY
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DESCRIPTORS- *ELEMENTARY SCHOOLS, *SCHOOL DESIGN, *SCHOOL LOCATION, SCHOOL CONSTRUCTION, SCHOOL EXPANSION, SCHOOL SPACE,

THIS PROGRAM FOR AN ELEMENTARY SCHOOL FACILITY REQUIRES 21 CLASSROOMS WITH THE POTENTIAL FOR ACCOMMODATING AN INCREASE OF SEVEN CLASSROOMS. THE PLAN SOLUTION WAS CHOSEN UPON REVIEW OF FIVE DIFFERENT SCHEMATIC TYPES. A MULTI-WING PLAN WAS DEVELOPED WITH A CENTRAL CORE, TWO CLASSROOM WINGS, AND A SEMI-DETACHED KINDERGARTEN ELEMENT. EXPANSION OF THE COMPACT BUILDING IS POSSIBLE AT FOUR TERMINAL LOCATIONS WITHOUT EXCESSIVELY LONG CLASSROOM WINGS OR FUNCTIONAL DISTANCES. EMPHASIZED AS PROJECT CONSIDERATIONS ARE--(1) PROVISIONS FOR FALLOUT PROTECTION, (2) CONSTRUCTION DATA, (3) STRUCTURAL DATA, (4) MECHANICAL AND ELECTRICAL SYSTEMS, AND (5) ADAPTIVE CONSTRUCTION DATA. A FLOOR PLAN AND PERSPECTIVE ARE INCLUDED. (MH)

ED0189938

STATE OF NEW YORK
STANDARD SCHOOL PLAN

TYPE A-2

EF 000554

EXPANDABLE ELEMENTARY SCHOOL 21-28 CLASSROOMS - ONE STORY

STATE OF NEW YORK

STANDARD SCHOOL PLAN

TYPE A-2, ONE-STORY

21-28 CLASSROOM ELEMENTARY SCHOOL

-REPORT-

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
OFFICE OF EDUCATION

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N.Y.S. REPORT
Standard School, Type A-2

EDUCATIONAL FACILITIES AS PROVIDED IN PLAN TYPE A-2

These correspond satisfactorily to the recommendations of the State Education Department, and as modified in conference with other educational and architectural advisors.

TEACHING SPACES

No.	Title or Use	Comments
3	Kindergarten	
1	Classroom	Future Kindergarten
8	Classrooms	
9	Classrooms	Corridor Lockers Related Areas
1	Library	
1	Special Classroom	
1	Remedial Reading	
1	Double Playroom	Showers-Lockers
1	Cafeteria-Assembly	Platform Stage

ADMINISTRATIVE, PERSONNEL & COMMUNITY SPACES

No.	Title or Use	Comments
1	Administration	Suite
1	Conference	
1	Teachers Room	
1	Health	Suite
1	Kitchen	Related Areas

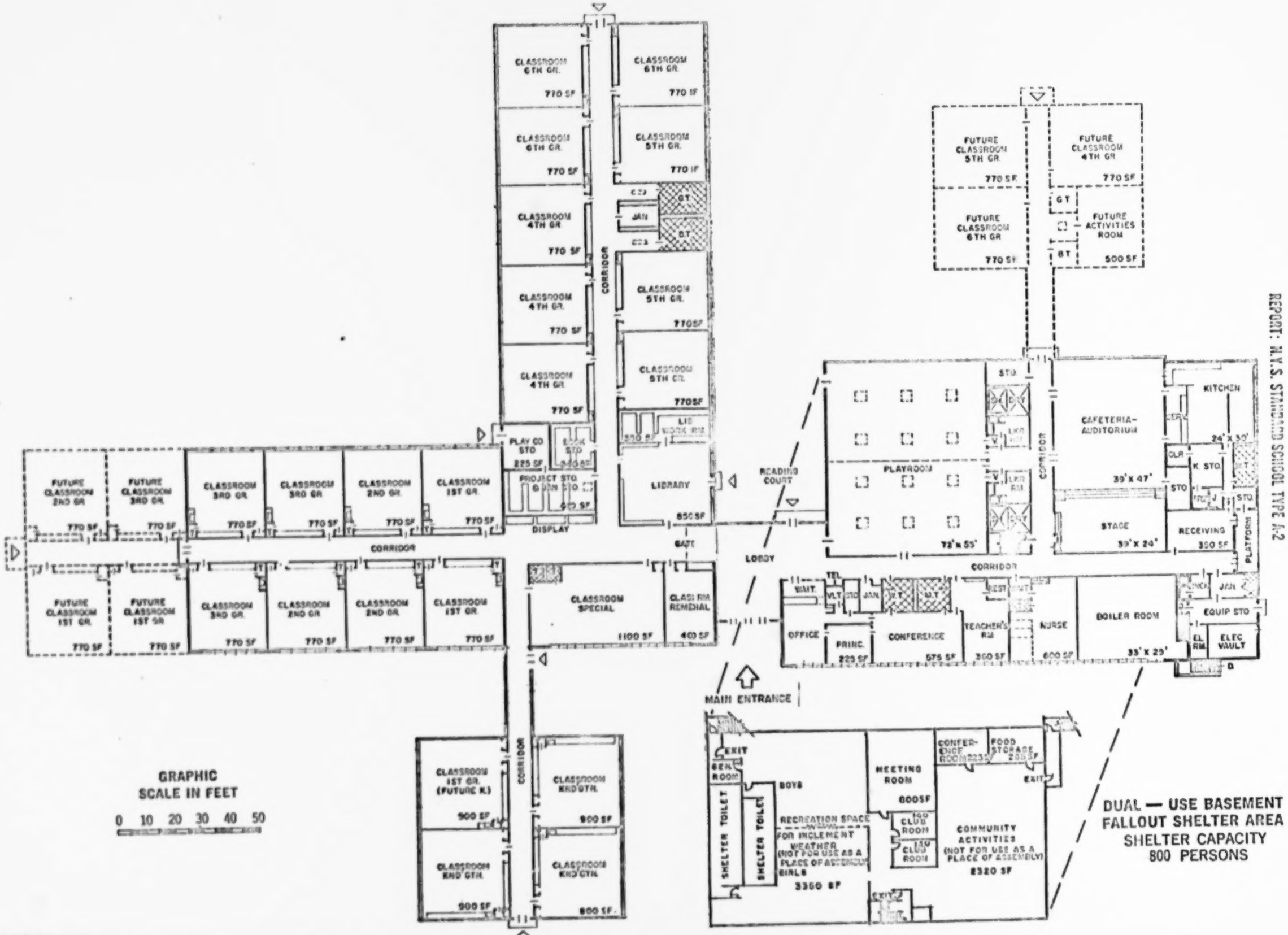
FOR FUTURE EXTENSION

7	Classrooms
1	Activities Room

DUAL USE SHELTER AREA

2	Toilet Rooms
1	Generator Room
1	Recreation Space
1	Meeting Room
1	Conference Room
2	School Club Rooms
1	Food Storage Space
1	Community Activities Space

NOTE: The areas of all spaces noted above can be found in the floor plans.


CLASSROOM 6TH GR. 770 SF
CLASSROOM 6TH GR. 770 SF
CLASSROOM 6TH GR. 770 SF
CLASSROOM 5TH GR. 770 SF
CLASSROOM 4TH GR. 770 SF
CLASSROOM 5TH GR. 770 SF
CLASSROOM 4TH GR. 770 SF
CLASSROOM 5TH GR. 770 SF
CLASSROOM 4TH GR. 770 SF
CLASSROOM 5TH GR. 770 SF
CORRIDOR
JAN
GT
BT
PLAY CO STO 225 SF
BOOK STO 240 SF
PROJECT STO & JAN STO 90 SF
DISPLAY
LIB WORK RM 320 SF
LIBRARY 850 SF
READING COURT
GATE
LOBBY
FUTURE CLASSROOM 2ND GR 770 SF
FUTURE CLASSROOM 3RD GR 770 SF
CLASSROOM 3RD GR 770 SF
CLASSROOM 3RD GR 770 SF
CLASSROOM 2ND GR 770 SF
CLASSROOM 1ST GR 770 SF
FUTURE CLASSROOM 1ST GR 770 SF
FUTURE CLASSROOM 1ST GR 770 SF
CLASSROOM 3RD GR 770 SF
CLASSROOM 2ND GR 770 SF
CLASSROOM 2ND GR 770 SF
CLASSROOM 1ST GR 770 SF
CLASSROOM SPECIAL 1100 SF
CLASS RM REMEDIAL 400 SF
CORRIDOR
CLASSROOM 1ST GR. (FUTURE K) 900 SF
CLASSROOM KND GTN. 900 SF
CLASSROOM KND GTN. 900 SF
CLASSROOM KND GTN. 900 SF.
GRAPHIC SCALE IN FEET
0 10 20 30 40 50
FUTURE CLASSROOM 5TH GR. 770 SF
FUTURE CLASSROOM 4TH GR. 770 SF
FUTURE CLASSROOM 6TH GR. 770 SF
GT
FUTURE ACTIVITIES ROOM 500 SF
BT
STO
CAFETERIA-AUDITORIUM 39'x 47'
KITCHEN 24'x 30'
CLR
K. STO.
STO
STAGE 39'x 24'
RECEIVING 350 SF
PLATFORM
PLAYROOM 72'x 55'
CORRIDOR
WAIT.
TEL
VLT
STO
JAN
W.T.
M.T.
WEST
OFFICE
PRINC. 225 SF
CONFERENCE 575 SF
TEACHER'S RM 350 SF
NURSE 600 SF
BOILER ROOM 33'x 25'
JAN
SNACK
EQUIP STO
EL. RM.
ELEC VAULT
MAIN ENTRANCE
EXIT
GEN. ROOM
BOYS
SHELTER TOILET
SHELTER TOILET
RECREATION SPACE FOR INCLEMENT WEATHER (NOT FOR USE AS A PLACE OF ASSEMBLY) GIRLS 3360 SF
MEETING ROOM 600SF
CLUB ROOM 100
CLUB ROOM 150
CONFERENCE ROOM 225SF
FOOD STORAGE 280SF
EXIT
COMMUNITY ACTIVITIES (NOT FOR USE AS A PLACE OF ASSEMBLY) 2320 SF
EXIT
DUAL — USE BASEMENT FALLOUT SHELTER AREA SHELTER CAPACITY 800 PERSONS
REPORT: N.Y.S. STANDARD SCHOOL TYPE A-2

REPORT

STANDARD SCHOOL PLAN TYPE A-2

21-28 CLASSROOM ELEMENTARY

for

STATE OF NEW YORK

DEPARTMENT OF PUBLIC WORKS

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NEW YORK STATE

STANDARD SCHOOL PLAN, TYPE A-2, 21-28 CLASSROOM ELEMENTARY

REPORT

PREFACE

The planning of a school building undertaken to fulfill the needs and requirements of a specific community, school district or system presents a real challenge to its Architect. The planning of a Standard School building presents an even greater challenge, in that, it is intended for application to many varying conditions. Of importance are considerations given to flexibility, expandability, and suitability of the building to meet such differing conditions and structural variations. It is inherent that latitude be incorporated encouraging decision in the final selection of certain materials by local Authorities and their adapting Architects.

The educational problem presented by a 21-28 classroom Elementary School as a single unit is familiar to the general public. Concept as to the suitability of such a school building will vary, however, with the area in which it is built, its educational program, climate, topography, local preferences and financial capacity. It is inherent that a standard school plan should be economical in concept. This will permit its adoption with little adjustment by communities or districts which are economically minded. There are a range of substitutions which may be made to adjust the durability of various materials or to reduce to a degree maintenance costs. The building planned to meet this program is flexible in these considerations.

1. EDUCATIONAL

A. Program

The Program and Room Schedule established for this project indicate a self-contained Elementary School Building to contain initially 21 Classrooms expandable to the total of 28 Classrooms. Other classrooms scheduled include one (1) Special Classroom, a room for Remedial Work, and a Library. A one-story solution was directed. Supplemented by other teaching areas, such as a Playroom and Cafeteria-Auditorium of prescribed sizes, and other non-teaching areas such as

Administration rooms, Utilities and Circulation, a relatively large Elementary School is developed. This building will house at its 21-Classroom size, some 580 pupils, and at the 28-Classroom size, some 780 pupils - distributed equally grades Kindergarten through Sixth in both instances, plus the special class.

Educationally, this project is considered to be maximum in pupil capacity commensurate with economy in staffing and operation. An elementary building housing a greater number of pupils is not uncommon. Such a building, however, tends to require duplication at administrative level and of certain common facilities.

A Dual-Use Fallout Shelter is incorporated in the school.

B. Assumptions

Various fundamental assumptions are here set forth bearing upon Educational requirements:

Kindergarten is to be day long.

Remedial Area may serve for corrective work in Reading, Speech or Psychological fields.

Locker-Shower Area is included primarily for use of upper elementary grades.

Special Classroom is included for the retarded.

Pupil occupancy is planned for an average of 50% boys - 50% girls.

Expansion from 21 to 28 Classrooms will provide an addition of one classroom each grade, K through 6 inclusive.

Until expansion, one of the four Kindergartens will be used as a classroom; after expansion it is used as a Kindergarten.

Areas of expansion are to be arranged so that their construction will result in minimum disturbance to operation of the school.

Certain facilities such as Playroom, Cafeteria-Auditorium, Library and related sanitary facilities may be used by the public during summer or other non-school hours.

Specific rooms or areas for Art and for Music, not included in initial Room Schedule, may be added in conjunction with future additions; other areas may be assigned for these subjects, or such instruction continue to be provided on an in-classroom basis.

C. Conclusion

In an Elementary school of this size, the grouping of Kindergartens, of Primary grades, and of Upper-Elementary grades is desirable. The pupil population of the Primary grade rooms is 243 with provision to expand to 324, representing a fair-sized school unit by itself. Such grouping of kindred elements and similar facilities can enhance teaching practices. The social grouping of Kindergarten by itself, of Grades 1 through 3, and of Grades 4, 5, and 6 has been accepted widely.

The centralizing of common facilities is desirable, such as Playroom and Cafeteria-Auditorium as a core, equally accessible from all classroom groupings. These are areas of high noise level, and thus disturbing to quieter classroom areas. The availability of these areas to the classroom units, and to the public, is a primary consideration, as well as their physical separation from the classrooms themselves. To reduce traffic of public functions, it is desirable that such central facilities be near to the main entrance and public parking.

The location of the Special Classroom is deserving of particular consideration. To insure that these pupils are not made to feel that they are outsiders, it is essential that this classroom be located within the general teaching area. As outdoor activity will occupy an increased amount of these pupils' school day, direct access to the exterior is desirable.

Special considerations govern location also of the Library, which should be accessible to all classrooms, should be particularly inviting, and may be enhanced by access to an exterior court.

The location of the Administrative area, including Office, Principal, Nurse and Teachers' room, as these relate to operation of an educational plant of this size, will benefit if treated as a collected element near to the main entrance.

Related importantly to the welfare of elementary pupils is the matter of safety. This consideration can govern the placement of various teaching elements in relation to other building functions; those in particular involving vehicular traffic or other hazards. This should govern also the placement of Playrooms so that these have direct access to a playing field.

In summary, it is stated that, while differing one-story solutions were investigated, and are discussed later in this report, the proper educational and functional relationship of the various parts of the building to ea other and within a building as a whole governed approach to this problem. In considering individual rooms, the Room Schedule established for the project was followed without change. Inclusion of both a Playroom and a Cafeteria-Auditorium eliminated need for the consideration of various multi-purpose classrooms. The classrooms, themselves, are made essentially square in shape to reduce corridor length, and are treated so as to accommodate the three general grade levels - Kindergarten, Primary, and Upper-Elementary. Additions are planned, as required, to provide more classroom space at each general grade level.

2. REVIEW OF PLANNING

A. Assumptions

Elimination of Site Development from the scope of this project makes necessary the basic assumption that planning should be based upon a flat site.

Objective is to plan a project in the median cost per square foot range. It is assumed that the consideration of economy is to be balanced against high maintenance and replacement costs.

Program directs that scope of the project extend 1'-0" below the First Floor upper surfaces only. Exception is the Boiler Room located below grade, the Dual-Use Fallout Shelter area and crawl space located below the Kitchen area. Certain utilities are shown beyond the 1'-0" below First Floor slab, and are limited also to entrance and exit from the building. Footing and foundation design, utilities' planning, sanitary disposal, site development, exterior lighting, and planting plans, accordingly, are reserved for development by local authority, except that construction and utility plans for the Fallout Shelter area are complete and are incorporated in drawings and specifications for the Project.

Provision is made for addition of seven future classrooms. It is assumed that the Local Authority may limit, further extend, or re-plan such future additions as conditions direct. Conversely, in instances wherein a shower program is not contemplated, assumption is made that area provided for such facility will be replanned locally, as example, for Music Instruction, Visiting Teachers' Desk Space or for Storage.

B. Contemporary Trends

In study of various plan solutions for this project essentially five (5) differing trends were considered. These are discussed in the following.

The Compact Rectangle - described briefly as a block type plan with central core, exterior light borrowed using clear story and dome-lights for interior classrooms. Corridors may be included or omitted. In the latter instance, pupils pass through other classrooms to reach central facilities.

This solution was considered but not pursued. Reliance placed in such scheme on relatively few "lighting days" throughout the school year is more applicable to the Southwest than to average New York State climate. The corridorless school is better in its application to secondary education than to elementary where a large percentage, but not all, instruction takes place in the grade room.

The Flat Roof with Voids - similar in general concept to the Compact Rectangle, supplemented, however, by light-wells dropped down from the roof to first floor level to provide natural exterior lighting for essentially interior plan areas.

This solution was considered and likewise not pursued. While natural light for classrooms is made acceptable, numbers of interior courts are developed requiring provision for snow and rain removal. These present considerable expense. A more pertinent deterrent to consideration of this scheme is that while roof area may approximate other solutions, ground coverage of the overall project can almost be doubled.

The Cluster or Circular Plan - described briefly as a central core with encasing or projecting classroom elements.

This solution was partially developed and rejected.

The Cluster Plan is adaptable more readily to a smaller project than one containing 21-28 classrooms in addition to considerable core square footage.

The Triple Elementary - described briefly as a central core with three separated and connected K-6 elements, the fourth to be added in the future.

This solution was partially developed and rejected.

In order to insure reasonable separation between K-6 elements, separating these also from a central core, and, using also connecting elements, an excessively extenuated plan again resulted. It is deemed, also, that the concept of adding of a future K-6 element as a single block at one location lacks flexibility. There are other variations possible in this scheme; grouping of Kindergartens, Primaries, and Upper Elementaries. This offers a more acceptable educational solution but resulted also in an excessively extenuated plan.

Multi-Wing Plan - similar in broad aspect to the Triple Elementary with grade division as later in that plan discussed. The important departure lies in the close connection of wings to the central core rather than their deliberate detachment.

This solution was developed.

3. DEVELOPMENT OF PLAN

A. General

The Multi-Wing Plan discussed in the preceding formed the basis for further study and plan development. The principal of zoning of various grade levels in groups was incorporated in these studies.

Three plans were developed employing a Central core with two classroom wings. Future additions were planned at the extreme ends of these.

Two plans were developed again with central core, with two classroom wings and a semi-detached Kindergarten element.

The final scheme is a development of the study last mentioned.

B. Analysis of Various Plans

The plans with two classroom wings were based zone-wise on the division K through 2nd and 3rd through 6th. The description of these may be made very brief as each resulted in extremely long individual wings particularly with future additions included.

Two of these include plans with classroom wings in an "L" shaped disposition. In the third, the classroom wings are placed on a widening "U" shape. The core in each case is located either at base or near to the intercese of wing intersections.

The detachment of the Kindergarten group as a separate third wing or block was a logical development in effort to reduce the extreme length of the classroom wings. Two such plans were studied and in the latter of these the Upper-Elementary addition was treated in a manner similar to the separated Kindergarten unit. Some elements of the separated and connected scheme are here reflected.

With respect to the Kindergarten unit, in these later studies, it should be stated that in order to meet the program, the initial such unit is comprised of three (3) Kindergartens and one (1) First Grade room. In the 28

Classroom expanded plan the First Grade is relocated and the area thus vacated assigned as the 4th Kindergarten.

C. Conclusion

There is little appreciable difference in overall square footage or basic economy in the five plan studies discussed. The governing factor leading to development of the plan last mentioned is its relative compactness and workability compared with other solutions.

4. RECOMMENDED DESIGN

Effort has been made to provide Plans and Specifications for the project meeting fully the Educational Program and those factors discussed in other portions of this report.

As earlier mentioned - objective is to plan a project in the median cost range, also, one allowing for exercise by local authority of governing decision relative to a number of alternatives effecting not only cost, the inclusion of various systems, but also, location and content of later additions.

Within limits of the Program the project is a complete one.

The functional relationship of the various major elements of the building, Educational, Common Facilities, Administrative, and Utility areas should provide an efficient building.

Grouping and location of the respective classrooms by grade groups in separate wings should enhance the Educational potential of the project.

The building is expandable at two locations as indicated, however, not limited to these alone. Expansion at four locations is feasible.

Excessively long classroom wings have been avoided, as well as extreme distances between various functional portions of the overall project.

It is understandable that a standard plan may require adjustment to meet unusual condition of site, education program, and like considerations.

The building planned for the Type A-2, 21-28 Classroom Elementary School should lend itself well in meeting its programmed application.

5. PROVISIONS FOR DUAL-USE FALLOUT PROTECTION

A. General

The dual-use fallout shelter included in this school was developed by the Department of Public Works in cooperation with the Education Department and can be utilized in a variety of ways to augment the school program and the affairs of the community. Suggested functions which the shelter space might serve are: meetings of scouts groups on all age levels, meetings of other community organizations and school purposes such as student government quarters, publications rooms, recreation, areas for a variety of remedial purposes, administrative offices, large group instruction and audio-visual activities.

B. Design

The plans for the shelter are architecturally and mechanically complete with the exception of the structural design for the sub-grade work. This work is to be completed by the adapting Architect to meet whatever the existing soil conditions might be.

The size of shelter space, the capacity of the mechanical systems, and the provisions for food and water storage are based upon the expanded capacity of the school with a proper allowance for teachers and staff. Any special conditions which will affect the capacity of the school will require changes in these factors of the fallout shelter design.

The location of the shelter under the building was made to obtain the best protection at the lowest possible cost. A change in the location of the shelter will necessitate additional shielding design. Shielding has been obtained by both separating with distance and with mass, the planes on which radioactive particles will rest in relation to the shelter area. It is to be noted that any dimensional or material changes in the area above the fallout shelter may affect the shelter design. For this reason the minimum

mass of the interior partitions, floor construction and total overhead construction upon which the shelter calculations have been based are indicated on the drawings. If materials of lesser mass than the tabulated values are used redesign of shelter will be required. It also has been assumed in the calculations, that finish grade is never below the bottom of the first floor slab around the shelter area. It is, therefore, necessary to maintain this grade in order to avoid redesign of shelter.

The shelter plan indicates emergency water supply in a group of tanks within adjacent crawl space. Whenever an adequate supply of well water can be obtained it is suggested that the adapting Architect substitute it as the fallout shelter water supply. The plans show self-contained toilet facilities in the form of sanitary tanks fitted with toilet seats. Wherever a septic tank and leaching field are available and the supply from the well is adequate, it is suggested the adapting Architect substitute a system using periodic flushing of waste. Generator capacity should be checked, however, to be sure that an adequate power supply is made available, during the emergency period, for these possible substitutions.

The shelter area is designed for a minimum protection factor of 100 by use of "Design and Review of Structures for Protection from Fallout Gamma Radiation", an official Office of Civil Defense, Department of Defense Publication. In this respect it meets requirements of the New York State Civil Defense Commission.

Any changes to the shelter as specified and shown on the drawings should be discussed with and approved by the New York State Civil Defense Commission.

6. CONSTRUCTION

A. Factors

Factors governing choice of Construction methods and materials are interrelated with those governing Structural and Mechanical. Additional factors related directly to Construction are:

Modular planning and dimensions are employed throughout all plans based on a 4" base module.

Site Planning, while not a part of project scope, is to be considered to extent that a reasonably adjustable solution is developed planned so that it will meet various egress conditions.

Flexibility within reasonable limits is to govern selection of material and finish.

Built-in work is to be limited in scope. This is with the view that classroom cabinet work may be added, also doors for classroom wardrobes, etc. at option of the local authority.

Liberal use may be made of pre-fabricated elements, also, relatively standardized installations - for floor covering, wall finishes, etc.

The basic 8'-0" grid system elected for application to structural applies with equal importance to construction.

Kitchen work is to be incorporated in the General Construction work contract.

B. Construction System

With selection of a Structural skeleton steel frame, and avoidance of the use of bearing wall support, enclosure of the building involves primarily the handling of curtain walls and of self-supporting masonry walls. At the windowless end wall of various wings brick-core-wall construction was selected, as well as for certain utility areas, to provide a contrast to metal building-panel steel and glass enclosing walls at other locations. Pre-cast concrete building panels are interspersed with building panels at classroom walls and are employed, also, to enclose higher exterior walls of Playroom and Cafeteria-Auditorium. A widely competitive basic system thus is developed lending itself to many variations in color selection and finish. Local selection is thus encouraged.

Poured Gypsum roof decking was selected due to economy as well as good relative insulating qualities. There are a number of alternatives available for local consideration including pre-cast concrete, Tectum and steel decking. Pre-cast concrete plank is provided at Boiler Room for safety in event of possible boiler accident.

Poured reinforced concrete foundation walls, and at certain areas below first floor slab poured reinforced concrete piers, form the foundation support and support of the concrete slab covering the Dual-Use Fallout Shelter. Membrane waterproofing at the Boiler Room floor and walls is included as dictated by protection of equipment at such sub-soil location. Slab-on-grade construction is planned except for area of the Dual-Use Fallout Shelter, Boiler Room, Crawl Space below the Kitchen and between the Fallout Shelter and Boiler Room wall. Slabs-on-grade are to be mesh reinforced.

Wide use is made of plastered steel-stud divider and corridor walls throughout the project. For higher enclosing walls of areas such as Playroom, concrete block is planned surmounted by interior metal panels. These latter are of sound-absorbing type to reduce noise level. Similar treatment is planned for Cafeteria-Auditorium. Various other interior enclosing walls are as directed by codes considerations such as 8" brick at Electrical Vault.

Ceilings are omitted throughout the entire building with the exception of smaller occupied areas such as Waiting Room, Offices, etc. Various types of formboard, including Sonofaced Acoustical Formboard at certain locations are employed and used in conjunction with bar joists and bulb tee construction. These materials are selected on a performance basis; hard white plaster is called for where appropriate for sanitary reasons.

Metal door bucks are used throughout. Use of these is preferred in conjunction, particularly, with steel-stud partitions.

Vinyl asbestos tile flooring is included at Lobby and one corridor which will receive heavier traffic, selected for wearing quality; asphalt tile is utilized in most other areas.

A considerable number of elective alternates may be included at option of local authorities, apart from those above mentioned; several are:

In lieu of plastered steel stud partition - concrete blocks.

Classroom ceilings may be added, utilizing "tee" support or other systems.

In lieu ceramic glaze corridor wainscots - facing tile.

Precast concrete exterior panels provided in simple form may be in decorative or of moulded pattern, vari-colored or monochrome.

Standard double wood-flooring on sleepers or pre-fabricated wood floor may be utilized in lieu of asphalt tile specified for Playroom and Stage floor.

Corridor and other ceiling materials - a wide variety of acoustical materials may be used as alternates.

Terrazzo Lobby and Corridor floor may be substituted for vinyl asbestos tile where indicated.

Provision is made in planning for addition of seven additional classrooms, also area for Art area, or as an alternative, a Music Room. This latter area could serve also, if desired, as a covered outdoor space. Areas for additions are so located that their construction may be undertaken simultaneously or at separate times as required.

Provision of facilities for Physically Handicapped include: One wheelchair toilet stall and one lavatory for boys at first floor level with same provision for girls; one 30" high drinking fountain at same floor level; and, one ground level entranceway with a door wide enough and operable for wheelchair user.

C. Kitchen Work

Kitchen work is planned as a part of the General Construction contract. Necessary Mechanical and Electrical facilities and connecting of same are provided for in the mechanical and electrical plans and specifications.

An all stainless steel and an all electric operated kitchen is planned. An installation of this type is the most serviceable. Electric operation is selected for its wider application statewise.

The serving area is planned for a single line. This can readily be arranged into two "L" shaped serving lines by introduction of two additional doors for exiting and modest counter rearrangement.

A range hood type of cooking exhaust is included. Areas for ample Food Storage and separately for Cooling and for Freezing are provided. Separate compressors are included for latter.

Dishwashing facilities are of high-speed, heavy capacity and include booster heater for 180° water.

Room for expansion of Food Preparatory facilities is provided and indicated on plans to meet a greater load with school expanded to larger pupil capacity.

7. STRUCTURAL

A. Factors

Factors governing choice of the structural system for this project are:

This is a one-story building with slab-on-grade construction for the first floor slab, except for area of the Dual-Use Fallout Shelter, Boiler Room, and crawl space below Kitchen, and the party wall between Fallout Shelter and Boiler Room.

Economy dictates selection of a competitive system.

Comparatively short spans of classrooms constitute the majority of areas to be covered.

Roof slabs need be designed for a light snow load.

Exterior walls are for the most part of the curtain wall type.

A level roof surface is elected to assure low roofing cost and minimum building volume.

An 8'-0" basic grid system is planned.

Wood framing and structure being combustible was eliminated and selection made between structural steel framing and concrete framing.

B. System

A detailed comparison between structural steel and concrete framing included study of economy in column spacing, beam and joist spacing, roof decking and bracing. Structural steel was selected due primarily to economy in roof decking utilizing poured gypsum, formboard and bulb-tees. The reduction in size of columns and the increased flexibility in space arrangement are factors also in that selection. In considering concrete framing, a concrete deck was also considered to obtain maximum return for forming costs and concrete plant.

With the basic classroom width of 28 feet and an elected window module of 4'-0", the development of the 8'-0" basic grid led to 8'-0" beam spacing arranged running from exterior columns to corridor columns. With the use of steel tube columns, it was possible to locate corridor columns within the corridor wall and was elected to locate exterior columns at the interior side of exterior classroom walls, independent of curtain wall treatment. The enclosing curtain wall thus is insured as an independent installation from the structure. In the same vein, use is avoided of bearing walls so that this structural steel may progress independent of enclosing elements.

For classroom and most areas, beams are used. At classroom areas a 12" beam depth is adequate, and, in conjunction with columns necessary stiffness of structure is obtained. Use of bar joists is limited to larger spans of Playroom and Cafeteria-Auditorium. These are not used in classroom and other areas, as additional construction depth would result. Overhangs are framed employing welded structural outrigger and cast in place slab, insulated.

Corridor beams are purposely shallow to allow for pipes and ducts over corridor ceilings.

Typical steel framing for roofs is provided with a stiffer moment connection at top, so that side-sway of the building can be resisted regardless of the strength of column connections at the base.

Framing has been calculated at all areas where ceilings are omitted for the future addition of ceilings. As example, Classrooms, Playroom, Auditorium-Cafeteria, etc.

Interior columns are either tubular shape or structural members depending on location and surrounding construction details.

The first floor slab has been designed for slab-on-grade construction except for the areas aforementioned, of the Dual-Use Fallout Shelter, Boiler Room and where crawl space occurs below the Kitchen and other minor area. There are no pipe trenches provided. Design of the supporting columns and covering slab, as well as floor slab and enclosing walls, also supporting beams for the Fallout Shelter area are poured reinforced concrete throughout, in keeping with standards for the construction of such facilities.

Expansion joints are included as required for the construction described in the foregoing. These are located to correspond with expansion joints in the roof structure. Double piers will be required where double columns are employed in connection with these joints.

Where soil conditions dictate, a structural first floor slab may be elected in lieu of the slab-on-grade construction included in this project. This would be under a most adverse condition.

8. MECHANICAL AND ELECTRICAL

A. General

Heating, Ventilating, Plumbing and Electrical planning and design have been governed by the appropriate National and State Codes, also prepared in conformity with criteria established by the New York State Education Department.

B. Heating & Ventilating

Factors considered in selected Heating and Ventilating systems for this project include: Safety to occupants and operating personnel; use of proven standard manufactured components to minimize service, replacement and shut-down time, initial operating and maintenance cost, flexibility of operation, and, type of building and comfort of its occupants.

The Heating System selected is circulating hot water utilizing oil-fired burners and steel fire-tube Package-type Boilers. There are recognized advantages in other systems such as warm air, steam, also electric heat. The relatively trouble-free nature of circulating hot water, longer piping life and safe operating temperature, are governing considerations in selection of hot water. Slab-on-grade construction affects this selection. Distribution is sub-slab in perimeter shallow trenches.

The system is designed to provide a 70 degree F. inside temperature with outside weather at -10° F. This will suffice for most New York State areas.

Classroom Unit Ventilators are included throughout, with Unit Ventilators also in Library and large unit area, used in areas of assembly such as Playrooms and the Cafeteria-Auditorium. The capacity of such units to provide tempered air, also, to reduce temperature in overheated class and assembly rooms is a determining factor in selecting this equipment. Fin radiation, convectors, and unit heaters are used in other areas as appropriate to effect economy. All units are thermostatically controlled.

Apart from partial exhaust function of unit ventilators, gravity exhaust is provided at all corridors - to exhaust via registers at inner walls of the classroom located at area of coat hanging spaces. Direct exhaust is provided at sanitary areas, to be manually controlled.

Direct air input is planned for areas of larger Assembly, apart from unit ventilation, to assure that moisture and odor will not build-up in these rooms.

Capacity is planned in sizing of Boilers and circulating lines for addition of seven (7) classrooms.

C. Plumbing

Factors considered in selecting Plumbing equipment and materials for this project are similar to those set forth for Heating and Ventilating.

The Plumbing System is limited in scope to the building proper to the extent that the separate storm and sanitary lines terminate five feet from the building; water service entrance is located with all in-building distribution forming limit of these plans. This is as required by Program, which precluded site considerations and planning.

Various planning criteria are set forth in the following:

Piping is concealed to the greatest extent practicable; pipe spaces being provided as required or piping located in pipe chases.

Material is selected which is properly durable, adjusted as required for sub-soil, above grade, or in-building installation.

Mounting heights for the fixtures in various areas are selected with attention to the grade level to be served. Floor mounted waterclosets have been selected. Other sanitary fixtures are wall mounted, with floor drains included, also, in major toilet areas, locker-shower area, kitchen and boiler room

H.W. control for showers is provided by a mixing valve at shower areas. This is apart from pressure valves operated by pupils. Purpose is to insure safety for those using showers.

Classroom sinks and bubblers are separated as required; stainless steel is elected for these much used installations.

Faucets for hand washing are metered-type control.

Bathroom type mirrors are located remote from lavatories also for maintenance purposes.

Mop receptors, floor mounted, are provided in lieu of wall sinks, as more practicable in day-to-day use.

Capacity in sizing of supply and drainage lines is planned for additional seven (7) classrooms.

D. Electrical

Factors considered in selecting electrical equipment and systems for the project are similar to those set forth for mechanical installations. Reasons for choice of more important electrical equipment and systems include the following:

Transformer equipment located in the building is provided for as a most economical means of furnishing electric service. This does not preclude election of a Distribution Load-Center combining both transformer and secondary distribution equipment.

All lighting and power panelboards included in the project are of circuit breaker type with moulded case breakers. This is to insure safety and facilitate maintenance.

Rigid conduit is selected for Lighting and Power Wiring Systems throughout the project. Future flexibility and maintenance influenced this selection.

Fixtures selected to furnish artificial illumination include both fluorescent and incandescent, employed as appropriate to meet desired lighting levels at various areas. In general, all classrooms and other working areas such as offices employ fluorescent lighting designed to provide 50 foot candles. Similar lighting is provided for the Playroom at level of 25 foot candles; Cafeteria-Auditorium is lighted conversely at 25 foot candles utilizing incandescent fixtures. These latter are employed in other areas, corridors, toilets, storage rooms and the like. The fixtures are selected for efficiency of output at desired lighting levels, to insure a well-lighted project, protecting vision of its occupants.

E. Drainage and utilities available at certain sites will require consideration and may influence, in various particulars, site selection.

F. All matters related to site are omitted in the plans prepared for this building. Matters to be reduced to plans and specifications by the local Architect, supplementing the Standard Plans for this project are:

1. Foundation design and bearing capacity.
2. Consideration of other than slab-on-grade construction.
3. Electrical service entrance to site.
4. Drainage and Sewage Disposal systems.
5. Clearance of Site.
6. Orientation and Grading.
7. Access and Egress; road systems.
8. Development of play fields and parking.
9. Exterior lighting and signs.
10. Planting plans.
11. Such adjustments in plan as are required to meet the educational program of local authorities.
12. Such adjustments in drawings and specifications as are required by local authorities relative to selection of alternative materials.

G. Construction of the project is envisioned under the direct supervision of the local Architect. His responsibility in addition to planning and reducing to specification those items referred to above should include:

1. Assisting the local authority in bidding of the project.
2. Assistance in the award of contracts.
3. Supervision of construction, or observation of same, as stipulated.

4. Approval of sub-contractors' and contractors' cost breakdown.

5. Approval of applications for payment from contractors.

6. Approval of shop drawings as the work progresses.

7. Preparation of color schedules and approval of material finishes and samples.

8. Interim and final inspections relative to acceptance of the work.

9. Financial accounting to the local authority as work progresses and upon completion.

10. Preparation of operating instructions.

11. Assistance as required in furnishing and equipping the building.

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